

Pine Needle Scale

Tiny, white, tear drop-shaped scales on conifer needles

Name and Description—*Chionaspis pinifoliae* (Fitch) [Hemiptera: Diaspididae]

Adult female pine needle scale insects are about 1/8 inch (3 mm) long, dark orange, and wingless under an armor scale covering they secrete that is about 1/3 inch (8 mm) long. They are the most conspicuous form, with the scale being almost pure white, elongate oval, and yellow at the apex (fig. 1). Developing males are similar to developing females, though smaller at 1/25 inch (1 mm) long and more slender. The minute adult males have wings when mature, but are rarely present in western populations. The immature crawler stage is generally oval, light purple to reddish brown, and tiny (fig. 1). Rusty brown-colored eggs are deposited under the scale covering. The characteristic white armor coverings can be seen on needles any time of the year, although the insects beneath the coverings may not all be alive. Pine needle scale is distributed throughout North America but is most common in the northern half of the United States and southern Canada.

Hosts—Pines, spruces, white fir, Douglas-fir, and cedar; may be common on shelterbelt and ornamental plantings of native and introduced pines, especially mugo pine.

Life Cycle—The pine needle scale has two generations per year in much of Colorado. Twenty to 30 eggs are laid in the fall by the female and overwinter under her scale covering. Some females may survive winter and lay eggs in spring. As they lay eggs, the females gradually shrink in size while the scale fills with eggs. Regardless of overwintering stage, egg hatch occurs over a relatively brief period sometime from late April to mid-June, depending upon local weather and location. The nymphs, or crawlers, then wander over the needles for a few days, select a needle, insert their sucking mouth parts, and begin feeding on sap. Wind is responsible for most of the dispersal of crawlers to uninfested trees. Females are sessile after settling and will remain on one needle for the rest of their lives. Feeding nymphs turn yellow and lose their appendages by molting. Combining their cast skins with waxy secretions, the pine needle scales create the characteristic protective white covering. When present, males also remain in place, developing as a scale and feeding until they emerge from the covering as minute, winged adults, flying off in search of females. Pine needle scales mature by early July. Clusters of eggs are then laid with or without mating in a white, waxy sack under the scale covering. Scales of this second generation mature by fall and lay overwintering eggs under the scale covering. In areas where there is one generation per year, scales mature by the end of summer and lay overwintering eggs.

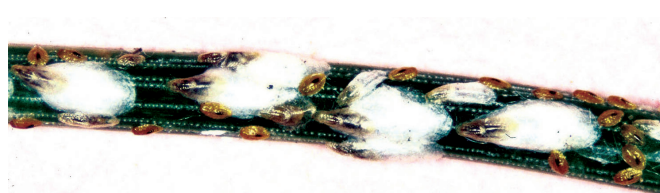


Figure 1. Close-up of small immature and larger mature female pine needle scales with newly-hatched brownish crawlers. Photo: E. Bradford Walker, Vermont Department of Forests, Parks and Recreation, Bugwood.org.



Figure 2. Heavy infestations of pine needle scale on blue spruce. Photo: Whitney Cranshaw, Colorado State University, Bugwood.org.



Figure 3. Heavy infestations of pine needle scale on pine. Photo: Scott Tunnock, USDA Forest Service, Bugwood.org.

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Damage—Pine needle scale feeding causes a yellowing of the foliage in the area surrounding each sessile scale, and these areas coalesce when trees are heavily infested. Consequently, the foliage on heavily infested trees becomes discolored. The waxy, white, secreted coverings of the scale insects and black mold that grows on scale exudates often combine to give infested trees a grayish appearance (figs. 2-3). Heavy infestations can result in premature needle shed. On pines, infestations can result in a marked reduction in needle length and a diminished growth rate. Outbreaks are frequently confined to limited areas on a given tree. Prolonged infestations, rare in natural forests in this Region, can kill branches and even young trees and can weaken larger trees, predisposing them to attack by opportunistic insects and diseases. Planted pines can be severely damaged. Scale infestations are often associated with factors that negatively affect host tree vigor. In addition, conditions that adversely affect scale predators and parasites such as road dust or pesticide application can result in significant infestations.

Management—Being sessile, pine needle scales are the target of many predatory and parasitic insects and other natural enemies that frequently exert a high degree of control. Of particular note is a lady beetle species whose annual life cycle is synchronized with that of the scale. Severe cold temperatures are thought to limit outbreaks by reducing survival of the overwintering stages.

In planted settings, proper tree care is a primary management strategy against scale insects, including pruning heavily infested branches. Refrain from planting pines or other hosts along dusty roads or in areas of heavy air pollution. Minimizing tree stress is key to keeping scale populations low, which will also lower susceptibility to other insect and disease pests.

Direct control options include the use of horticultural oils and insecticidal soaps, which are not toxic to and, therefore, will help conserve insect natural enemies active against the scales. Additional registered insecticides are also available, but they have wider non-target insect toxicity. Armored scales are more difficult to kill with insecticide due to their protective covering. Applications should be carefully timed against the crawler stage, which immediately follows egg hatch.

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